

What is claimed is:

- 1 1. A method of producing a biotin vitamer by:  
2 (a) culturing a bacterium comprising a lysine-  
3 utilizing DAPA aminotransferase, said culturing taking place  
4 in an environment enriched for lysine, a lysine analog, or a  
5 lysine precursor; and  
6 (b) recovering said biotin vitamer.
- 1 2. A method of producing a biotin vitamer by:  
2 (a) culturing a bacterium comprising a lysine-  
3 utilizing DAPA aminotransferase, wherein said bacterium is  
4 deregulated with respect to lysine production; and  
5 (b) recovering said biotin vitamer.
- 1 3. The method of claim 1 in which the bacterium is  
2 engineered to overproduce a lysine-utilizing DAPA  
3 aminotransferase.
- 1 4. The method of claim 2 in which the bacterium is  
2 engineered to overproduce a lysine-utilizing DAPA  
3 aminotransferase.
- 1 5. The method of claim 2 or claim 4, wherein  
2 lysine, a lysine analog, or a lysine precursor is  
3 exogenously added to the culture.
- 1 6. The method of ~~claim 1~~, claim 2, ~~claim 3~~, or  
2 claim 4, in which lysine, a lysine analog, or a lysine  
3 precursor is exogenously added to the culture and totals at  
4 least 10 mmoles per liter of culture.

1           7.    The method of claim 1, claim 2, claim 3, or  
2   claim 4, in which the biotin vitamer is biotin,  
3   dethiobiotin, or diaminopelargonic acid (DAPA).

1           8.    The method of claim 1, claim 2, claim 3, or  
2   claim 4, in which the biotin vitamer is dethiobiotin, and,  
3   after recovering the dethiobiotin, the method further  
4   comprises converting the recovered dethiobiotin to biotin by  
5   a separate fermentation, biochemical reaction, or chemical  
6   reaction, and recovering biotin.

1           9.    The method of claim 1, claim 2, claim 3, or  
2   claim 4, in which the bacterium is resistant to a lysine  
3   analog.

1           10.   The method of claim 9, wherein said analog is  
2   S-2-aminoethyl-L-cysteine (AEC).

1   ~~sub A11~~ 11.   The method of claim 1 or claim 2, in which the  
2   bacterium is deregulated with respect to at least one biotin  
3   synthetic pathway step in addition to *bioA* expression.

1           12.   The method of claim 1, claim 2, claim 3, or  
2   claim 4, in which the biotin vitamer is biotin, and the  
3   method comprises recovering and purifying the biotin.

1   ~~sub A12~~ 13.   The method of claim 1, claim 2, claim 3, or  
2   claim 4, wherein said bacterium is further engineered to  
3   produce a SAM-utilizing DAPA aminotransferase.

1           14.   The method of claim 13 in which methionine, S-  
2   adenosylmethionine (SAM), or an analog of SAM is added to  
3   the culture.

1           15. The method of claim 13 wherein lysine, a lysine  
2 analog, or a lysine precursor is added to the culture.

1           16. The method of claim 14, wherein lysine, a  
2 lysine analog, or a lysine precursor is added to the  
3 culture.

1 ~~sub A7~~ 17. ~~The method of claim 15 in which lysine or a~~  
2 ~~lysine analog exogenously added to the culture totals at~~  
3 ~~least 10 mmoles per liter of culture.~~

1           18. The method of claim 16 in which lysine or a  
2 lysine analog exogenously added to the culture totals at  
3 least 10 mmoles per liter of culture.

1           19. The method of claim 13 in which the biotin  
2 vitamer is biotin, dethiobiotin, or diaminopelargonic acid  
3 (DAPA).

1           20. The method of claim 13 in which the biotin  
2 vitamer is dethiobiotin, and, after recovering the  
3 dethiobiotin, the method further comprises converting the  
4 recovered dethiobiotin to biotin by a separate fermentation,  
5 biochemical reaction, or chemical reaction, and recovering  
6 biotin.

1 ~~sub A7~~ 21. ~~The method of claim 13 in which the bacterium~~  
2 ~~is deregulated with respect to at least one biotin synthetic~~  
3 ~~pathway step other than bioA expression.~~

1           22. The method of claim 13 in which the biotin  
2 vitamer is biotin, and the method comprises recovering and  
3 purifying the biotin.

1           23. A bacterium engineered to overproduce a lysine-  
2 utilizing DAPA aminotransferase and a SAM-utilizing DAPA  
3 aminotransferase.

1           24. The bacterial strains BI90 (ATCC \_\_\_\_ ) and BI96  
2 (ATCC \_\_\_\_ ).

1           25. The bacterium of claim 23, wherein the strain  
2 is further engineered to overproduce the biotin vitamer by  
3 engineered deregulation of at least one biotin synthetic  
4 step, in addition to *bioA* expression.

1           26. The bacterial strain BI603 (ATCC \_\_\_\_ ).

1           27. A bacterium engineered to overproduce a lysine-  
2 utilizing DAPA aminotransferase, wherein the bacterium is  
3 further engineered to overproduce lysine.

1           28. The bacterial strain BI641 (ATCC \_\_\_\_ ) or BI642  
2 (ATCC \_\_\_\_ ).

1           29. A biotin vitamer manufactured by the method of  
2 claim 1, claim 2, claim 3, or claim 4.

1           30. A biotin vitamer manufactured by the method of  
2 claim 13.

1           31. A biotin vitamer manufactured by the method of  
2 claim 14.